

NEMO - A NATIONAL OUTREACH PROGRAM TO EDUCATE MUNICIPAL OFFICIALS ABOUT THE RELATIONSHIPS BETWEEN WATER QUALITY AND LAND USE

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Abstract. Georgia joined the National Nonpoint Education for Municipal Officials or NEMO national network in October 2000 through joint efforts by the University of Georgia Marine Extension Service (MAREX), the Georgia Sea Grant College Program (Sea Grant), the Georgia Department of Natural Resources (DNR), and the national NEMO coordinators at the University of Connecticut Cooperative Extension Service. Initial program efforts will concentrate in two diverse areas of the state, coastal Glynn County, and the planned Atlanta suburban community, Peachtree City, in Fayette County. NEMO pilot programs will facilitate expanding the program to other communities.

The program will compile historical coastal Georgia water quality data, place it in a Geographic Information System (GIS) format, and transfer the information through outreach efforts to decision makers and stakeholders impacting coastal water quality. NEMO outlines a three-tiered strategy of comprehensive planning, site design, and the use of storm water best management practices that communities can adopt to address land use and cope with nonpoint source pollution.

NATIONAL NEMO NETWORK

The University of Connecticut Cooperative Extension System developed NEMO in 1991. NEMO was created to educate local land use decision makers about the relationship between land use and water quality. The National NEMO Network includes 19 funded projects, with 10 more at some stage of development (Pers. Comm., John Rozum). The projects have a few simple common denominators: (1) an educational approach, (2) a focus on local land use planning, and (3) the use of various geospatial and information technologies as educational tools. This program has received national recognition for its work. In 1996, the American Planning Association Small Town

and Rural Planning Division named NEMO an Outstanding Educational Program. In 1998 NEMO received the National Achievement Award for Land Use and Natural Resources from the *National Environmental Education Training Foundation* (NEMO, 1999). The Georgia chapter of NEMO joined the national program in October 2000. The core program started in Glynn County, which is located along the Southeast coast of Georgia. A second initiative designed to expand the training program will begin shortly in the Atlanta suburbs through the MAREX Office in Peachtree City, Fayette County. MAREX and Sea Grant will address vital state and regional coastal water quality issues through a coordinated effort, which is funded by a Coastal Incentive Grant from the Georgia DNR.

RELATIONSHIP BETWEEN NEMO AND DECISION MAKERS

Polluted runoff is the cumulative result of our everyday activities and land use policy decisions that are made mainly by local elected officials. Nonpoint source pollution, or polluted runoff is the number one water quality problem in the United States (U.S. EPA, 2000). City and county governments can play an important role in protecting water quality. Local governments have the power to pass ordinances that control many land-use activities through zoning and building codes.

Urban districts support large areas of impervious surfaces that include rooftops, parking lots, sidewalks and hard surfaced roads. Storm waters that once filtrated into the ground now carry these pollutants over many impervious surfaces and into our creeks, streams, rivers and estuaries. The impacts of polluted runoff include increased levels of nutrients, pathogens, sediment, toxic contaminants, debris, and thermal stress.

The increasing development of Georgia's coast has created a dire need to educate local land-use decision

makers about the relationships between land use, impervious surfaces, runoff, and water quality. NEMO has incorporated all of these important issues into a well-designed presentation. The Georgia NEMO program will concentrate on suburban/urban sprawl and its impact on water and natural resources in coastal Georgia.

COMPREHENSIVE PLANNING

The first stage in a comprehensive planning strategy is to take an inventory of the natural resources in an area. Initially, we will focus on researching and acquiring both historic and new state-of-the-art remotely-sensed (RS) data sets for coastal Georgia. One useful data set is the NOAA Coastal Remote Sensing/Coastal Change Analysis Program (C-CAP). This data set consists of change analysis Landsat Thematic Mapper scenes that were analyzed according to the C-CAP protocol to determine land cover and a subsequent change analysis from 1992 to 1997. The land coverage inventory consists of the entire Coastal Georgia Zone from Savannah, GA to Cumberland Island, GA; however, we will begin by focusing on the Glynn County area. This inventory and others will be collected and provided through presentations to help decision-makers reach prioritized decisions based on quantified natural resources. Effective methods to extract high-resolution data and accurately quantify urban sprawl and land cover are needed. The data and techniques required to develop metrics that describe sprawl and forest fragmentation will be investigated. Comprehensive planning will help prioritize areas for protection and target other areas for development. This will help the existing natural areas stay in a pristine state.

NEMO recommends incorporating open space into community expansion and development through an action plan that includes revised zoning and subdivision regulations to support the concept. A comprehensive plan for conservation and development provides the guidelines for protecting natural resources and balancing that protection with growth.

SITE DESIGN

The second stage in the NEMO program is site design. The objective at this stage is to return the landscape to its natural state if possible, but in most cases the realistic goal is to reduce impervious surfaces, encourage riparian buffers, and emphasize the importance

of on-site storm water drainage. The key to make this work is the concept that knowledgeable design of urban development solves the problem of runoff at the source (Ferguson, 1998).

Any development or alteration of the landscape should include working with the natural vegetation and land contours. This approach helps preserve the natural landscape and drainage patterns. Development increases the amount of impervious surfaces and the need for installation of more storm sewers. This speeds the movement of concentrated pollutants off-site and interferes with water infiltration into the ground. NEMO encourages the use of vegetated swales or biofiltration as an alternative for drainage that can increase the amount of on site infiltration by prolonging storm water contact with soil and vegetation. Site design can help conserve open space and reduce the amount of impervious surfaces. Development can be guided in a number of practical ways to protect water quality.

BEST MANAGEMENT PRACTICES

The third stage in this three-tiered strategy is to support Best Management Practices (BMP's) and/or stormwater management. Stormwater management is the process of controlling and cleansing excess runoff so it does not harm environmental resources or human health. An important consideration for any stormwater management system is water quality (Gibbons, 1995). BMP's and/or stormwater management may vary among municipalities, and among zoning districts within municipalities.

Minimizing impervious surfaces and maximizing storm water infiltration into the soil are the initial key foci of the Georgia NEMO program. The encouragement of redevelopment and infilling, the practice of reusing pre-existing developed areas, is the primary way to avoid further urban or suburban sprawl and excessive growth of impervious surfaces. Permeable pavement used in large pavement areas can increase rainwater contact with the underlying soil. Focusing on storm water management and on site drainage can help prevent and minimize water quality impacts in the more intensively developed areas of coastal Georgia.

SUMMARY

The Georgia chapter of NEMO started in October 2000. The University of Georgia Marine Extension

Service and the Sea Grant College Program based in Brunswick, GA will address vital regional and state coastal water quality issues through a coordinated effort, funded by a Coastal Incentive Grant from the Georgia Department of Natural Resources. The three-tiered strategy of comprehensive planning, site design, and the use of storm water best management practices form the basis for this program. Well-designed, interesting, and informative computer generated presentations will bring NEMO concepts to decision makers in both the public and private sectors.

NEMO focuses on local land use planning, and the use of various geospatial and information technologies as educational tools. The ease and cost of accessibility to current satellite based land use RS information will be critical to its long-term relevance to local decision makers. The potential uses of RS data are endless, but this potential carries the responsibility of translating this data into truly accessible and understandable information for the target audience.

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